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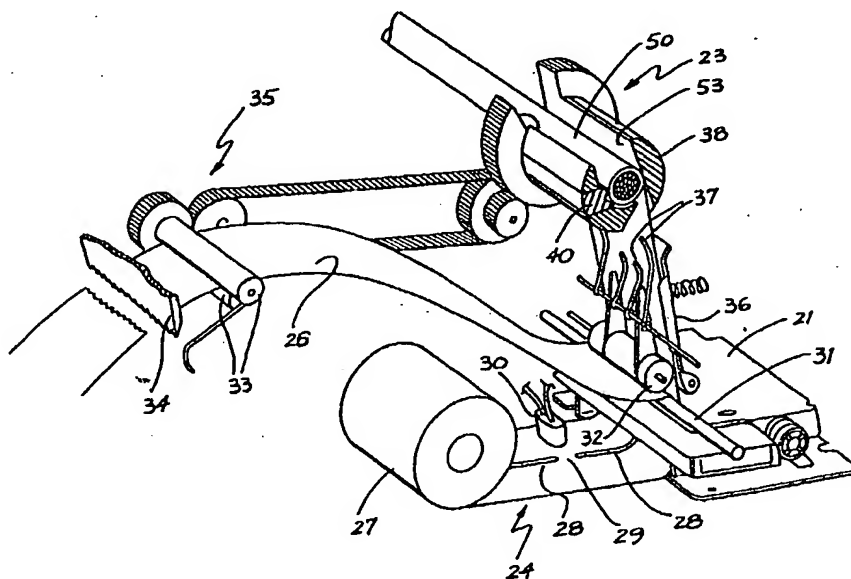
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<p>(21) International Application Number: PCT/AU87/00267 (22) International Filing Date: 17 August 1987 (17.08.87) (31) Priority Application Number: PH 7464 (32) Priority Date: 15 August 1986 (15.08.86) (33) Priority Country: AU (71) Applicant (for all designated States except US): FELS-DAWN PTY. LIMITED [AU/AU]; Level 19, National Mutual Centre, 44 Market Street, Sydney, NSW 2000 (AU). (72) Inventor; and (75) Inventor/Applicant (for US only) : AGUERO, Arthur [AU/AU]; 12/85 West Esplanade, Manly, NSW 2095 (AU). (74) Agents: HALFORD, Graham, William et al.; Halford & Maxwell, Level 20, National Mutual Centre, 44 Market Street, Sydney, NSW 2000 (AU).</p>		<p>(81) Designated States: AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent), FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent), US. Published With international search report.</p>

(54) Title: CABLE MARKING APPARATUS



(57) Abstract

An apparatus, for applying an identifying label (215) on a cable or similar article (50), which comprises a rotatable drum (23) into which is axially placed the cable or similar article. The drum has a radial slot through which the identifying label (215) is fed to contact the surface of the cable. On rotation of the drum the label is wrapped around the cable or similar article.

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CABLE MARKING APPARATUS

FIELD OF THE INVENTION

- 5 This invention relates to means for wrapping identifying tape or the like around cables or similar articles, particularly articles of approximately circular cross-section.

10 SUMMARY OF THE INVENTION

- In one form the invention resides in means for wrapping identifying tape or the like around cables or similar articles, comprising a rotatable drum having an axial
15 passage to receive one end of the article, means for presenting one end of a length of identifying tape to the surface of the article within the drum through a slot in the drum, and means for rotating the drum.

- 20 Preferably the longitudinal axis of the axial passage in the drum is off-set from the axis of rotation of the drum.

Preferably one side wall of said slot is substantially tangential to the central opening in the drum.

- 25 Preferably the orientation of the slot with respect to the identifying tape is such that said one wall forms a ramp for guiding the leading edge of the tape towards the cable.

- 30 Preferably biasing means are provided for urging the article into contact with the side wall of the axial passage at a location adjacent the slot.

- 35 The invention will be better understood by reference to the following description of a specific embodiment

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thereof, described here by way of example only, in a machine which is capable of printing identifying data onto a tape and thereafter applying the tape onto a cable.

5 BRIEF DESCRIPTION OF THE DRAWINGS

The description of the embodiment will be made with reference to the accompanying drawings, wherein :

- FIG. 1 is a schematic illustration of components of an
10 embodiment of the invention;
FIG. 2 is a schematic illustration of components of a modified form of the machine;
FIG. 3 illustrates the components of the wrapping station of the machine;
15 FIG. 4 is a simplified cross-sectional elevation showing the layout of components in the machine;
FIG. 5 is an elevation of a modified form of the wrapping drum and drum mounting assembly;
FIG. 6 is a section taken on the line 6-6 of FIG. 5;
20 FIG. 7 is a side elevation of the modified drum and mounting assembly in open condition;
FIG. 8 is a further elevation view of the assembly with the drum rotated relative to FIG. 5;
FIG. 9 is an end elevation of the drum assembly in open
25 condition; and
FIG. 10 an end elevation of the drum and mounting assembly in closed condition.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

- 30 The illustrated embodiment of the invention operates with labelling tape which has been pre-manufactured in a composite form, with a layer of adhesive on the back of the tape, protected by a removable backing strip. Such a
35 tape may conveniently be supplied in disposable cassettes, and fed to the tape wrapping station via a station at

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which the backing is removed.

In this embodiment, the tape as manufactured is provided with spaced indicia which may be detected by sensors
5 mounted in the tape path, so that as tape is fed from the cassette, an appropriate length of tape may automatically be cut.

In this embodiment also, the backing tape is preferably
10 used to assist in moving the tape through the machine, by drawing on the backing after it has been peeled from the tape.

As shown schematically in FIGS. 1 and 2, the major
15 components of the tape supply and feeding system of the illustrated embodiment comprise a tape cassette 20 (Fig. 2), printer 21, drive motor 22 and tape wrapping station 23. Tape 24, consisting of a label layer 25 and a backing layer 26 with interposed adhesive on the side of
20 the layer 25 facing the backing layer, is fed from a roll 27 contained within the cassette 20.

The tape, preferably on the backing layer 26, is provided with markers identifying predetermined label lengths. In
25 this embodiment these markers consist of longitudinal stripes 28 separated by gaps 29, the spacing between these gaps corresponding to the length of tape to be wrapped on the cable. Mounted in juxtaposition to the path of the tape adjacent the cassette is a sensor 30 for the
30 purpose of detecting the passage of the gaps 29. This sensing system may be optical or magnetic, or of course other techniques can be used to measure the feed of tape from the cassette in order to control the feed mechanism.

35 The composite tape 24 next passes through the printer unit which is preferably a miniature dot-matrix printer of

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conventional construction. Located adjacent the printer 21 is a small diameter roller or shaft 31 and a cooperating pressure roller assembly 32. The backing layer 26 passes between the rollers 31 and 32, and as a result of the small diameter of the roller 31, this layer is bent sharply to separate from the label layer 25, which continues upwardly towards the wrapping station 23.

The backing layer is drawn by rollers 33, and passes out of the machine, where it may be torn off by means of a cutting edge 34 on the casing of the machine.

The backing layer feed rollers 33 are driven in fixed relationship with the rotation of the wrapping station 23, by a drive chain shown schematically at 35 in Fig 1.

The label tape 25 is guided in its upward path to the wrapping station 23 by means of a spring-loaded support plate 36 located on the non-adhesive side of the tape, and wire springs 37 located on the adhesive side of the tape. These springs 37 are preferably coated with a material such as Teflon to minimize any tendency for the tape to stick to them.

As shown in the schematic cross-section of Fig. 3, the wrapping station 23 comprises a drum 38 with an axial cable passage 39 of substantially circular cross-section. The axis of the cable passage is off-set from the axis of rotation of the drum 23.

An elongated slot 41, the longitudinal axis of which is parallel to the axis of the cable passage 39, is provided for the delivery of the label 25 to that portion of the cable 50 lying within the passage 39. The side walls 42 and 43 of the slot 41 are angularly disposed, and substantially tangential to the wall of the passage 39,

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the side wall 43 providing a smooth transition between the slot 41 and the passage 39.

The cable 50 within the passage 39 is urged into
5 engagement with that portion of the side wall of the passage 39 which is adjacent the slot 41, by biasing means in the form of a wrapping bar 40. The wrapping bar 40 is slidably mounted in a radial passage formed in the
10 wall of the passage 39 by means of a spring 51. The inner end of the wrapping bar 40 is provided with a channel 52 for positive location of the cable with respect to the wrapping bar, this channel 52 being preferably V-shaped in cross-section to accommodate a range of cable
15 diameters.

The drum 38 is also provided with a radial slot 53 through which the cable 50 may be introduced into the passage 39, when the drum is orientated so that the slot 53 is
20 accessible at the top of the machine via a slot 47 in the housing.

Not illustrated in Fig. 1 to assist the clarity of that drawing is a cutting station at which the label layer is
25 cut to the correct length after separation from the backing layer. Such an arrangement is shown in Fig. 2, which also incorporates modifications to the arrangement shown in Fig. 1. In the embodiment of Fig. 2, the composite tape 24 passes upwardly from the printer 21 to
30 a separating shaft 35, from which the backing layer 26 is sharply bent downwardly to rollers 31 and 32. Mounted immediately above the feed roller 32 is a knife assembly 36, which when actuated will cut the label 25 at the shaft 35.

35

Movement of tape through the machine is preferably

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monitored by sensors (not shown) such as LED devices at crucial locations, particularly at the entry to the wrapping station 40, and the presence of a cable in the drum 28 is preferably also detected, suitably by means of a microswitch. The operating system of the machine, preferably under the control of a resident microprocessor which responds to data supplied via a keyboard 48 (Fig. 4), responds to the state of these sensors in operation.

Fig. 4 shows the general component layout which may be adopted in this second embodiment.

The operation of a machine according to this embodiment of the invention involves the following steps: firstly the cable is placed into the drum 28 by lowering it into the slots 47 in the housing of the machine, the drum 38 in its rest position being orientated so that the tape entry slot 53 is upwardly disposed for the reception of the cable. Next the data for the cable label is entered by means of the keyboard 48, and the key for "print and wrap" is pressed after the proposed label has been displayed on the read-out 49. The printer will then be actuated, and the tape will be drawn through the path already described, as the wrapping station operates in the manner also described above. The drum 28 is rotated 4 times, the rotations being detected by a microswitch (not shown) and counted by the processing circuitry. At the conclusion of four turns, the wrapper is returned to the orientation at which the cable may be removed upwardly from the drum, and the operation is complete.

Figs. 5 to 10 illustrate a modified form of the invention in which the drum 38 is constructed in two halves 38a and 38b. Each of the drum halves is provided with semi-circular flanges 54 at each of its ends and the drum halves are mounted by means of a fixed mounting block 55

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and a movable mounting block 56, the latter being mounted for sliding movement rearwardly of the machine.

Each of the mounting blocks 55 and 56 is provided with
5 semi-circular grooves 57 for co-operation with the flanges
54 of the drum halves. Thus, when the mounting blocks
are together as shown in Figs. 6 and 10, the drum halves
38a and 38b may rotate together as the flanges 54 follow
the grooves 57.

10

When the drum halves are orientated with the label entry
slot 41 in the orientation in which it will receive a
label 25, the movable mounting block 56 is freed for
rearward movement by means of the lever 58. Rearward
15 movement of the mounting block 56 and the associated drum
half 38b enables a cable to be placed between the drum
halves in readiness for labelling.

As shown in Figs. 9 and 10, each of the mounting blocks 56
20 is provided with a cable engaging member 59 mounted
slidably within the block 56 and urged towards the axis of
the drum 28 by means of a spring 60. The opposite
surface of the fixed mounting block 55 is provided with a
recess and with cable gripping tooth formations 61. When
25 the sliding mounting blocks 56 are released so that the
drum halves 38a and 38b close, the cable 50 is gripped
between the members 59 and the fixed mounting blocks.

The sliding mounting block 56 is biased to the closed
30 position by means of springs 62.

Shown in Fig. 3, is a finger 44 which is resiliently
biased towards the slot 41 and is radially movable within
a slot 63 provided in the wall of the drum 38. The
35 purpose of this touch finger 44 is to press the label
firmly against the cable as wrapping commences. The

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touch finger may be formed integrally with the material of the drum 38 as shown in Fig. 3, for example where the drum 38 is made of plastics material, and is hinged at 64. Where the drum 38 is of metal or of other material

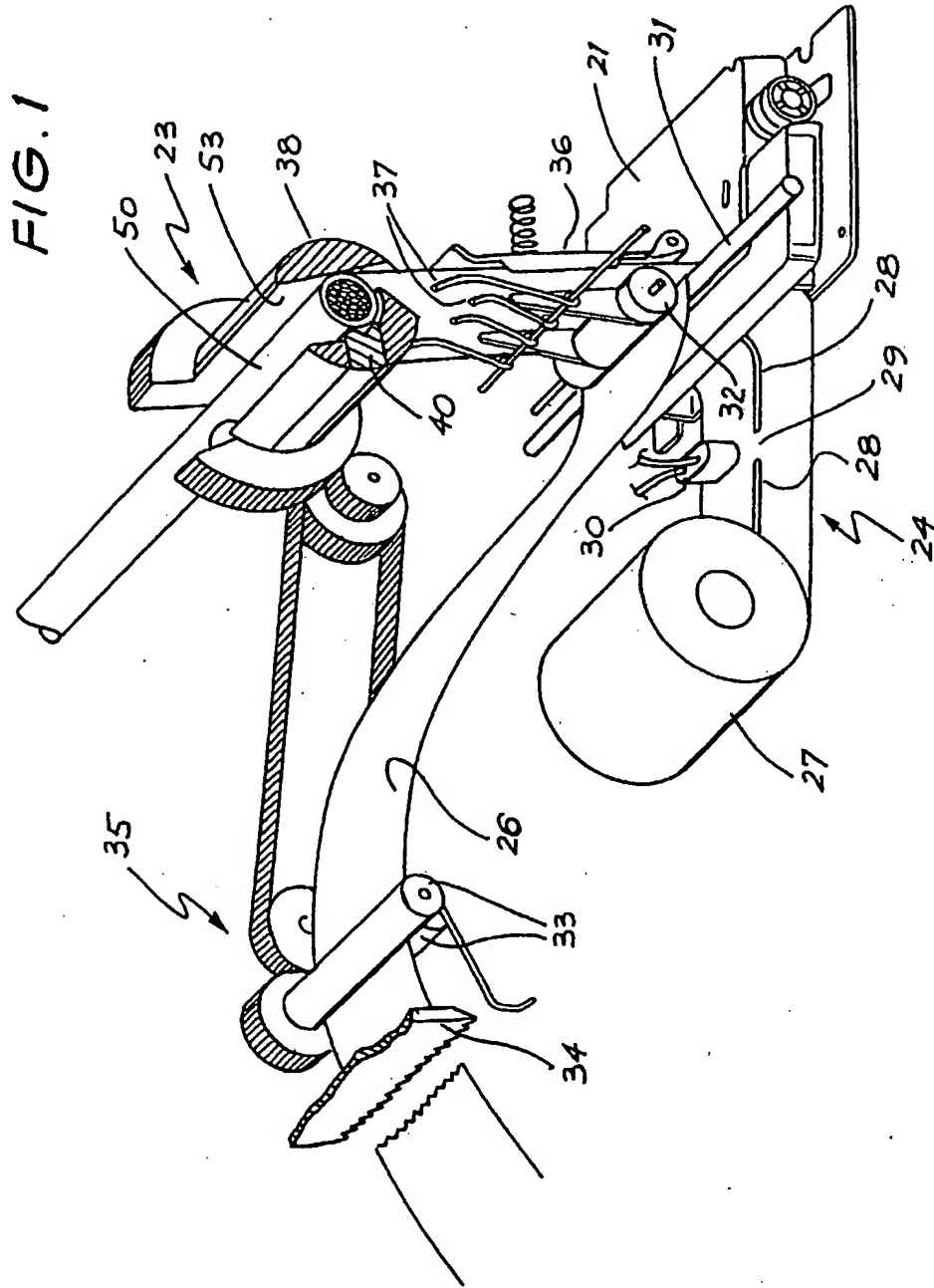
5 unsuitable for integral hinges such as that at 64, the touch finger 44 may be manufactured separately and provided with a biasing spring mounted on the drum 38.

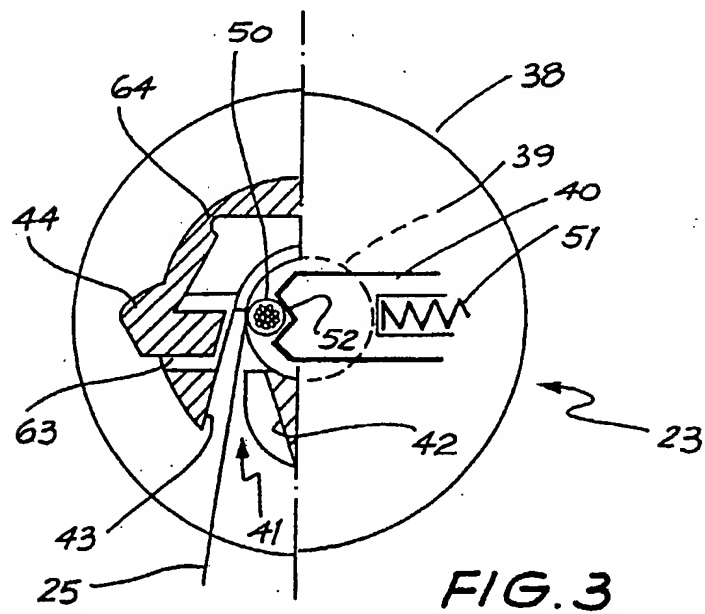
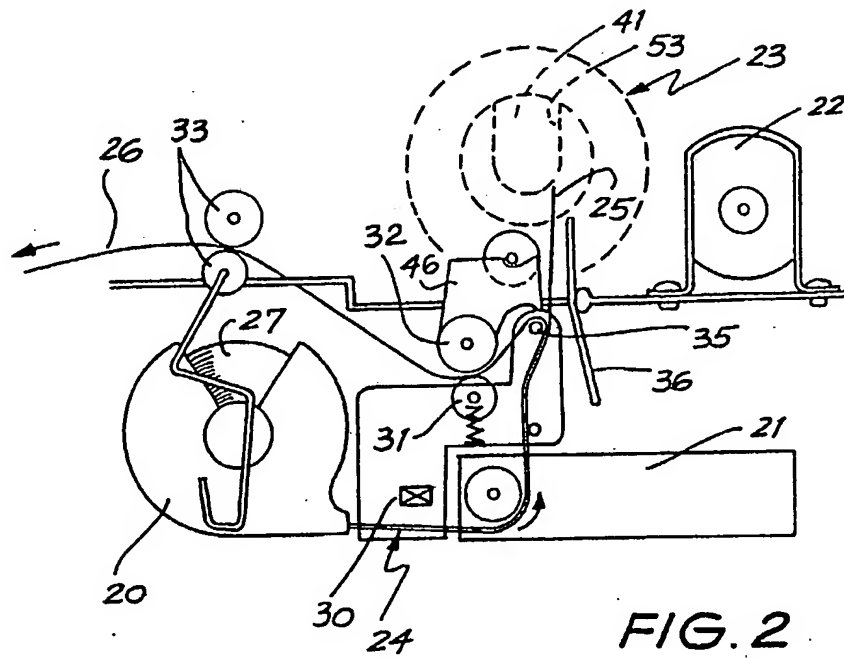
The present invention has thus been described in relation

10 to two embodiments. The principles described are capable of embodiment in other forms, and the invention is not to be regarded as limited by the particularity of the preceding description.

CLAIMS:

1. Apparatus for wrapping identifying tape or the like around cables or similar articles, comprising a rotatable drum having an axial passage to receive one end of the article, means for presenting one end of a length of identifying tape to the surface of the article within the drum through a slot in the drum, and means for rotating the drum.
2. Apparatus according to claim 1 wherein the axis of said passage is offset from the axis of rotation of the drum.
3. Apparatus according to claim 1 wherein said slot has a pair of side walls, one of said side walls being substantially tangential to said passage.
4. Apparatus according to claim 3 wherein said wall forms a ramp for guiding the leading edge of said tape towards the cable.
5. Apparatus according to claim 1 wherein biasing means are provided urging said article into contact with the side wall of said passage in the region of said slot.
6. Apparatus according to claim 1 wherein said drum is provided with a radial slot for the introduction of said cable to said passage, said radial slot being opposite said first mentioned slot.





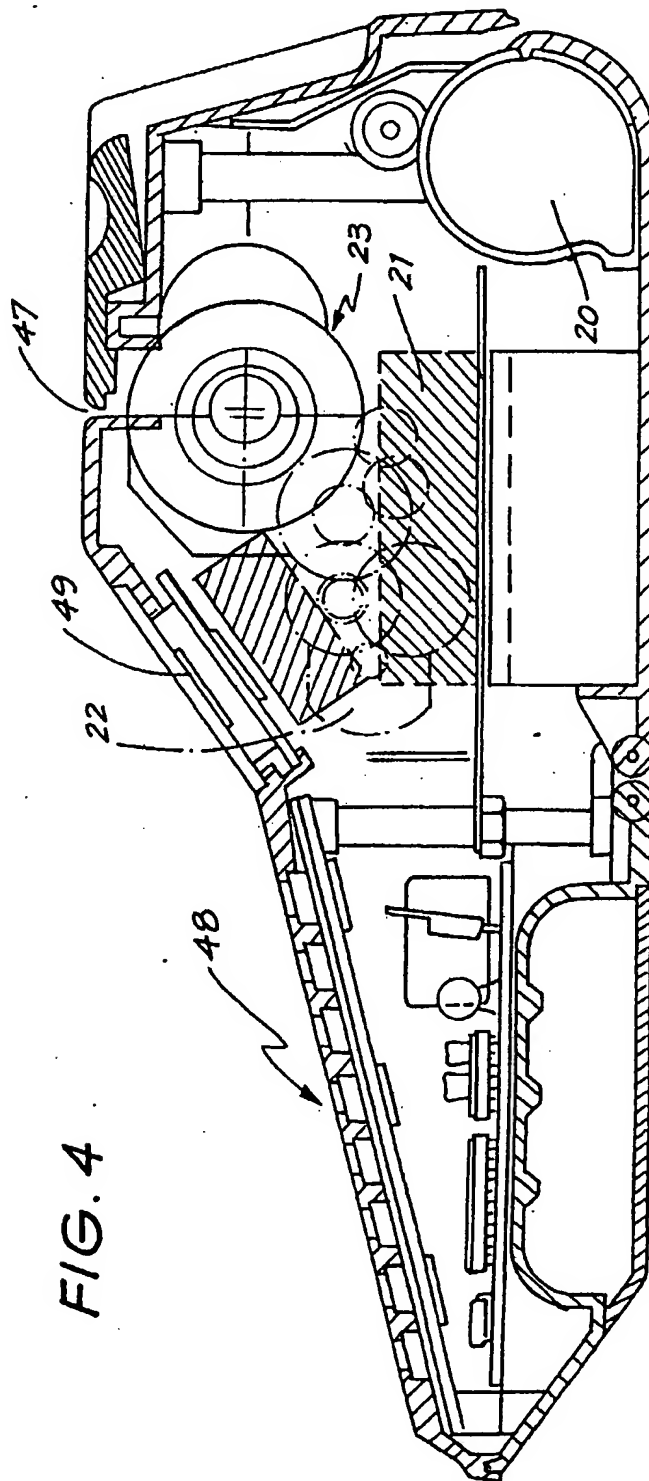


FIG. 4

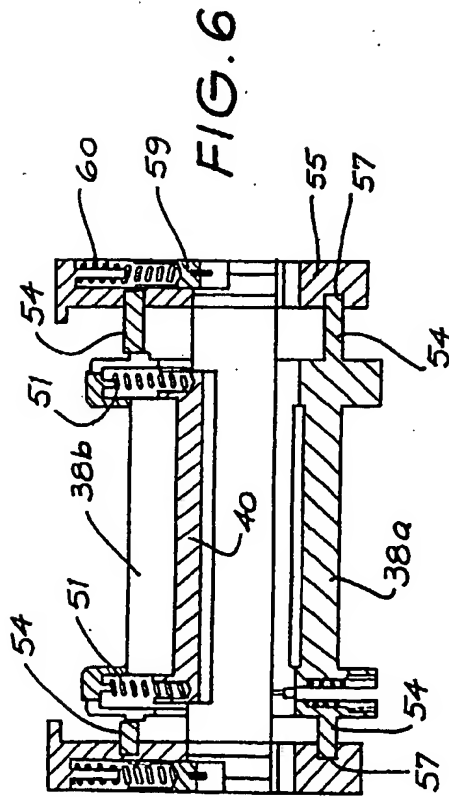
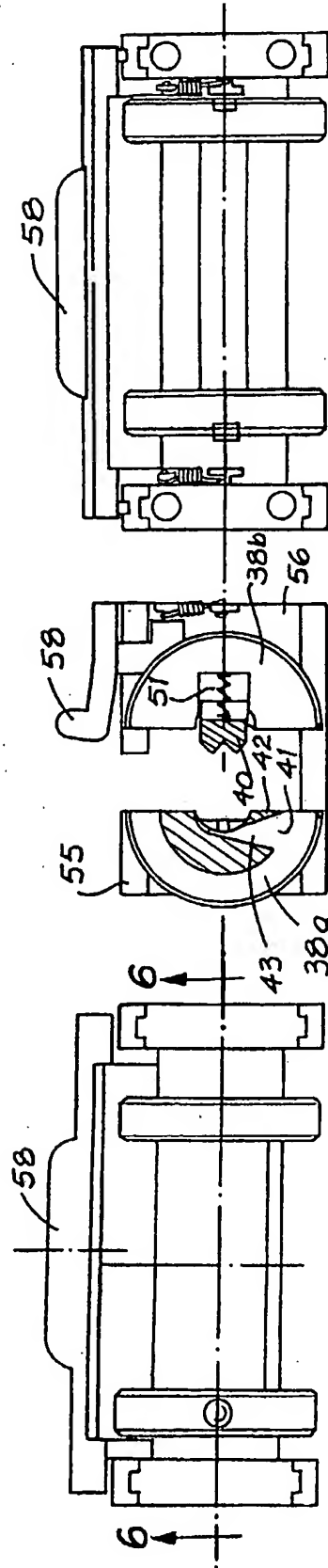


FIG. 8

FIG. 7

FIG. 5



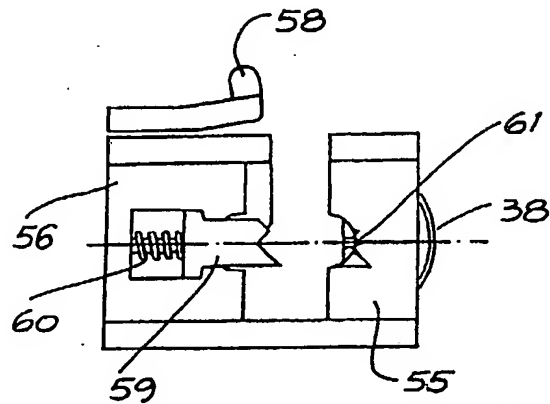


FIG. 9

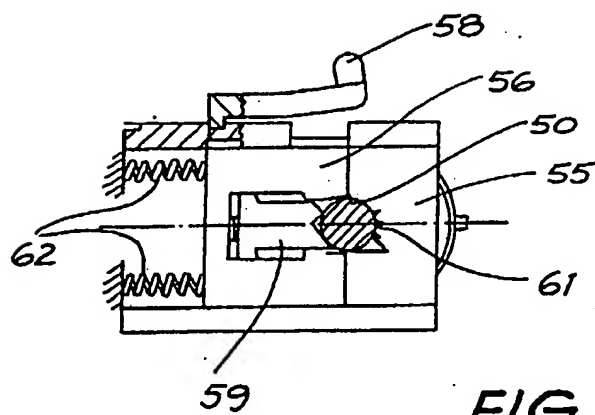
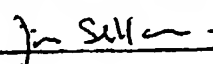
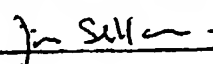
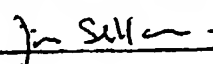


FIG. 10

INTERNATIONAL SEARCH REPORT

International Application No PCT/AU 87/00267

I. CLASSIFICATION OF SUBJECT MATTER : <small>(If several classification symbols apply, indicate all)</small> According to International Patent Classification (IPC) or to both National Classification and IPC Int. Cl. ⁴ B65C 3/02																			
II. FIELDS SEARCHED Minimum Documentation Searched * Classification System Classification Symbols IPC B65C 3/02 Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched * AU : IPC as above; Australian Classification 57.492																			
III. DOCUMENTS CONSIDERED TO BE RELEVANT * <table border="1"> <thead> <tr> <th>Category * 1</th> <th>Citation of Document, ** with indication, where appropriate, of the relevant passages **</th> <th>Referent to Claim No. **</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>GB,A, 628140 (ENTWISTLE) 23 August 1949 (23.08.49)</td> <td></td> </tr> <tr> <td>A</td> <td>US,A, 2402357 (BATES) 18 June 1946 (18.06.46)</td> <td></td> </tr> <tr> <td>A</td> <td>US,A, 2639830 (WEIMONT) 26 May 1953 (26.05.53)</td> <td></td> </tr> <tr> <td>X</td> <td>US,A, 3231445 (PEZZOLI) 25 January 1966 (25.01.66)</td> <td></td> </tr> <tr> <td>A</td> <td>EP,A, 129489 (DARD) 27 December 1984 (27.12.84)</td> <td>(1-4)</td> </tr> </tbody> </table>		Category * 1	Citation of Document, ** with indication, where appropriate, of the relevant passages **	Referent to Claim No. **	A	GB,A, 628140 (ENTWISTLE) 23 August 1949 (23.08.49)		A	US,A, 2402357 (BATES) 18 June 1946 (18.06.46)		A	US,A, 2639830 (WEIMONT) 26 May 1953 (26.05.53)		X	US,A, 3231445 (PEZZOLI) 25 January 1966 (25.01.66)		A	EP,A, 129489 (DARD) 27 December 1984 (27.12.84)	(1-4)
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IV. CERTIFICATION <table border="1"> <tr> <td> Date of the Actual Completion of the International Search 23 November 1987 (23.11.87) </td> <td> Date of Mailing of this International Search Report (09.12.87) 9 DECEMBER 1987 </td> </tr> <tr> <td> International Searching Authority Australian Patent Office </td> <td> Signature of Authorized Officer  </td> </tr> </table>		Date of the Actual Completion of the International Search 23 November 1987 (23.11.87)	Date of Mailing of this International Search Report (09.12.87) 9 DECEMBER 1987	International Searching Authority Australian Patent Office	Signature of Authorized Officer 														
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ANNEX TO THE INTERNATIONAL SEARCH REPORT ON
INTERNATIONAL APPLICATION NO. PCT/AU 87/00267

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Patent Document
Cited in Search
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Patent Family Members

EP 129489

FR 2547555

END OF ANNEX